Life and Times of Great Physicists from Galileo to Hawking

FOUN 094-39 Fall 2003

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Classes: MWF 10 - 11 am Taylor Hall 210
Video Sess.: M 7 - 9 pm Vaughan Literature Building 102

Office Hours: T 9 – 11 am, R 1 – 3 pm or by appointment

webpage: http://www.eg.bucknell.edu/~kvollmay/found_f2003/

Texts:

- Richard P. Brennan, "Heisenberg Probably Slept Here"
- William H. Cropper, "Great Physicists"
- Course Package: "Life and Times of Great Physicists"
- Richard P. Feynman, "Surely You're Joking Mr. Feynman"
- Michael Frayn, "Copenhagen"
- Robert B. Truscott, "The Essentials of College & University Writing"
- Kurt Vonnegut, "Cat's Cradle"

Course Description: This course is about scientists and their society.
During the first three weeks we discuss how scientists are portrayed. We use movies like Frankenstein, cartoons like Bugs Bunny, and literature like Cat's Cradle to extract common stereotypes.
For the rest of the semester we learn about the life, time and work of great physicists, beginning with Bacon and Galileo and ending with Hawking and other scientists of the present. As a guideline we ask questions like: Which kind of characters were they? What made them successful? What motivated them? Did their lives have anything in common? How were their lives influenced by their times, for example during World War II or as a minority in physics? Do we find certain stereotypes to be true?

Objectives: This course is a foundation seminar and is intended to help you with the transition to academic life at Bucknell. In the college setting you might encounter a different approach to learning than what you are used to from your high school.
The main goals of a foundation seminar are active learning, collaborative working, critical thinking, writing skills, familiarity with the library and computers, and learning good work habits. By active learning we mean that contrary to just listening, you take an active role in the course in group discussions, in which you form, share and reshape your own opinions. Collaborative work, a skill which will help you later in life, means that you do group work both in class as well as for projects out of class. Critical thinking is the process of understanding and evaluating issues which are complex and not simply right or wrong.
Summarized, our main goal is that you learn how to enjoy your time at Bucknell.

Course Structure: This course is a mixture of group discussions, mini lectures, video sessions, and trips to the library, writing center, and Career Development Center. There will be "daily assignments", which prepare you for each class and are handed in via email. They consist of some reading and/or writing assignment, often with questions which give you guidance for the reading and the opportunity to give me, the instructor, feedback about the reading and course. You will work on three main projects: an autobiographical paper, a paper and talk about a physicist in the past, and a paper and talk about a scientist of the present. The latter two projects will be done in groups of two. For both video sessions and your group meetings we have the additional Monday evening sessions.

Grading:

There will be no exams and no final! Since group discussions are a main component of the class, your participation is essential (16 %) and therefore attendance mandatory. If you must miss class (e.g. because of an athletic conflict), you *must* arrange with me *ahead of time* to make up the missed class. If this is not possible (e.g. last-minute emergencies), you must contact me immediately. Each unexcused missed class will result in *1/3 of a letter grade deduction from your final grade!* Of similar importance are the daily assignments (30 %) which prepare you for class and are part of your influence on the course. For any late daily assinment you get **no** credit. Effort is what counts most for participation and daily assignments.

The three main papers are each handed in as a first draft, on which you get feedback, as well as a final paper. Both the first draft and the final paper are included in your grade for each paper. For any late paper you get a one-tenth reduction for each calendar day (maximal reduction half credit).

Any writing you hand in should be your own words (or of you and your group partner for group work). Do not copy sections of any other source (world wide web, books, etc.) without quoting and referencing the source!

Class Participation		16 %
Daily Assignments		30 %
Autobiographical Paper		10 %
Physicist in Past		
	Paper	11 %
	Talk	11 %
Scientist in Present		
	Paper	11 %
	Talk	11 %

Course Syllabus

The following syllabus may change with the flow of the semester. Reading assignments of "Heisenberg Probably Slept Here" and "Great Physicists" (Cropper) have been abbreviated with HPSH and GP respectively. Reading assignments of our course package are indicated with *. The Writing Assignments column lists mainly the due dates of the three projects (in bold). It is incomplete since not all daily assignments are included. For more details see the updated daily assignments on our web page (http://www.eg.bucknell.edu/~kvollmay/found_f2003/).

Dates	Topic	Assignments listed by due date (see Daily Assign.)	
		Reading Assignments	Writing Assignments
Aug. 27	Introduction & Chain Writing		
Aug. 29	Computer Session & Disc. Chain Wr. & Plan Interview	Course Information Faust to Dr. Strangelove: Intro*	
Sep. 1	Cartoons & Present Interviews		**sketch of autob paper**
Sep. 3	Writing Center: Peer Review		**1st draft autob. paper**
Sep. 5	Frankenstein		**2nd draft autob. paper**
Sep. 8 7pm	Cat's Cradle Dr. Strangelove (Video)	Cat's Cradle	
Sep. 10	Stereotypes		
Sep. 12	Library Session		**final autob. paper**
Sep. 15 7pm	Bacon Galileo (Video)		The Baconian Vision*
Sep. 17	Galileo: Life & Work	GP pages 5 – 17	
Sep. 19	Galileo: Dialogue	Galileo on the World Systems*	

Dates	Topic	Assignments listed by due date (see Daily Ass.)	
		Reading Assignments	Writing Assignments
Sep. 22 7pm	Newton Newton (Video)	HPSH pages 11 – 43	
Sep. 24	Gibbs	GP pages 106 – 123	
Sep. 26	Maxwell	GP pages 154 – 178	
Sep. 29 7pm	Einstein: Work Einstein (Video)	HPSH pages 45 – 84	**1st draft project II**
Oct. 1	Einstein: Life		**2nd draft project II**
Oct. 3	Rutherford	HPSH pages 107 – 129	
Oct. 6 7pm	Curie Curie (Video)	GP pages 295 – 307 & Power*	
Oct. 8	Meitner	GP pages 330 – 343	**final draft project II**
Oct. 10	Science & Pseudoscience	The Seven Warning Signs ...* Placebos Have Side Effects*	
Oct. 15	What Motivates Scientists?	What Motivates Scientists*	What Motivates You?
Oct. 17	Writing Center: Talks		
Oct. 20 Oct. 22 Oct. 24	Talks: Biography of Physicist in Past		Summary of talks
Oct. 27 7pm	Heisenberg Copenhagen (Video)	HPSH 153 – 183	
Oct. 29	Copenhagen	Copenhagen: pages 3 – 94	

Dates	Topic	Assignments listed by due date (see Daily Ass.)	
		Reading Assignments	Writing Assignments
Oct. 31	Biographies & History Visit: G. Clingham	Copenhagen: pages 95 – 129 Newly Released Documents ...*	
Nov. 3	Science in Total. State	Scientists and The Totalitarian State*	
Nov. 5	Feynman (Video)	Surely You're Joking Mr. Feynman	
Nov. 7	Feynman: Life & Work	HPSH pages 185 – 212	
Nov. 10	Cancelled		
Nov. 12	Gell-Mann & Visit: S. Koutsoliotas	HPSH pages 213 – 241	**Bibliography project III**
Nov. 14	Science & Fraud	Misconduct Strikes ...*	
Nov. 17 7pm	Hawking Hawking (Video)	GP 452 – 463	
Nov. 19	Scientists in Present		**1st draft project III**
Nov. 21	Career Develop. Center		**2nd draft project III**
Nov. 24	Women in Science & Visit: P. S. Leboy	Women, Science,...*	
Dec. 1	Wrap Up Discussion		**final paper proj. III**
Dec. 3 Dec. 5 Dec. 8	Talks: Biography of Scientist in Present		Summary of talks